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ARTRAY Camera / Capture Module Software Developer Kit

ArtCamSdk_USTC.dll Ver1.276
ArtCnvSdk.dll Ver1.276

Dynamic Link Library for Windows2000,XP

User's Manual

27/6/2005

Artray Co., Ltd.

＜Introduction＞

This booklet explains about Software Developer Kit (SDK) for cameras and capture module (frame grabbers) provided by ARTRAY.

SDK is provided by Dynamic Link Library (DLL).
This library is designed for programmers in a way that they do not need to bother internal control of cameras and hardware.

This DLL can be used with C++, C, VB.NET, C#.NET and Delphi.

■ Use of Library

- This library is in the format of Windows Dynamic Link Library (DLL).
  This library is to be used in Microsoft Windows2000/XP. There is no guarantee of proper operation with other operating systems.

  This library partly uses MicrosoftDirectX8.1 (or later version). We do not have SDK specifically designed for MS DirectX8.1. However, installation of MS DirectX8.1 may be required to operate the library.

■Configuration of Library

ArtCamSdk_USTC.dll	ARTCAM-USTC DLL
ArtCnvSdk.dll	ARTCNV DLL
CArtCamSdk.h	Header file for C language
CArtCamSdk.cpp	Source file for VC++ (provided by class)
CArtCamSdk.hpp	Class header file for VC++
ArtCamSdk.cs *1	Class file for C#.NET
ArtCamSdk.vb*1	Class file for VB.NET
ArtCamSdk.pas	Class file for Delphi

Please install each DLL to SYSTEM/***** directory or copy to directory created for the compiler. Copy all other files to the directory prepared for software development.

*1 Depending on type of DLL, names may vary slightly
*2 System directories for Windows2000 and XP are as below.
Windows2000: C:¥WINNT¥SYSTEM32
WindowsXP: C:¥WINDOWS¥SYSTEM32

■API – Operational Procedure

C language

Copy **ArtCamSdk.h** and **DLL** to directory prepared for software development.

Based on **ArtCamSdk.h**, use **LoadLibrary** and **GetProcAddress** to obtain address of functions within DLL.

Once all pointers of functions, which are described in header are obtained, SDK is ready for use.

C++
Copy **CArtCamSdk.cpp, CArtCamSdk.hpp** and **DLL** to directory prepared for software development.

Once each file is built in Project, library can simply be used by a class called **CartCamSdk**, which is described in **CArtCamSdk.hpp**.
This class facilitates use of DLL that is dynamically read.

When you use functions of library, make sure to execute **CArtCamSdk:: LoadLibrary( )**.
If returned value is **TRUE**, call other function.
To end, call **CArtCamSdk::FreeLibrary**.

For details, please refer to one of the followings:
- Sample_VC.NET
- Sample_VC6
- Sample_BC

C#

Copy **CS files** and **DLL** to a folder prepared for software development.
Once CS file is added to Project, it's ready for use.

For details, please refer to:
Sample_CS.NET

VB

Copy **VB file** and **DLL** to a folder prepared for software development.
Once **VB file** is added to Project, it's ready for use.

For details, please refer to:
Sample_VB.NET

Regarding VB, we prepared SDK according to VB.NET.
There is no guarantee of operation with earlier versions.

DLL Functions For Each Product

■DLL Initial functions■

		USTC	CNV
ArtCam_GetDllVersion	P8	○	○
ArtCam_GetLastError	P9	○	○
ArtCam_Initialize	P10	○	○
ArtCam_Release	P11	○	○

■DLL image capturing functions■

		USTC	CNV
ArtCam_Preview	P12	○	○
ArtCam_Record	P13	×	×
ArtCam_CallBackPreview	P14	○	○
ArtCam_SnapShot	P15	○	○
ArtCam_Capture	P16	○	○
ArtCam_Trigger	P17	×	×
ArtCam_Close	P20	○	○
ArtCam_StartPreview	P21	○	○
ArtCam_StopPreview	P22	○	○
ArtCam_SaveImage	P23	○	○
ArtCam_GetImage	P25	○	○

■Dialog settings■

		USTC	CNV
ArtCam_SetCameraDlg	P26	○	○
ArtCam_SetImageDlg	P27	○	○
ArtCam_SetAnalogDlg	P28	×	×

■Camera settings■

		USTC	CNV
ArtCam_SetPreviewWindow	P29	○	○
ArtCam_SetCaptureWindow	P30	○*2	×
ArtCam_SetCaptureWindowEx	P31	○	×
ArtCam_GetCaptureWindowEx	P32	○	×
ArtCam_SetColorMode	P33	○	○
ArtCam_GetColorMode	P34	○	○
ArtCam_SetCrossbar	P35	×	×
ArtCam_SetDeviceNumber	P36	○	○
ArtCam_EnumDevice	P37	○	○
ArtCam_GetDeviceName	P38	○	○
ArtCam_Width	P39	○*3	○
ArtCam_Height	P40	○*4	○
ArtCam_Fps	P41	×	×
ArtCam_SetIOPort	P42	○	×
ArtCam_GetIOPort	P43	○	○
ArtCam_SetSubSample	P44	×	×
ArtCam_GetSubSample	P45	×	×
ArtCam_SetWaitTime	P46	○	○
ArtCam_GetWaitTime	P47	○	○
ArtCam_SetMirrorV	P48	×	×
ArtCam_GetMirrorV	P49	×	×
ArtCam_SetMirrorH	P50	×	×
ArtCam_GetMirrorH	P51	×	×
ArtCam_SetHalfClock	P52	×	×
ArtCam_GetHalfClock	P53	×	×
ArtCam_SetAutoIris	P54	×	×
ArtCam_GetAutoIris	P55	×	×
ArtCam_SetSamplingRate	P56	×	○
ArtCam_GetSamplingRate	P57	×	○
ArtCam_GetVideoFormat	P58	×	○
ArtCam_WriteSromID	P59	×	×
ArtCam_ReadSromID	P60	×	×

*2 Search appointed width and height from registered values. If the value is found by search, use that value.

*3 Value to be obtained is equivalent to **Heffective** of **ArtCam_SetCaptureWindowEx**

*4 Value to be obtained is equivalent to **VEffective** of **ArtCam_SetCaptureWindowEx.**

■Image filter settings■

		USTC	CNV
ArtCam_SetFilterValue	P61	○	○
ArtCam_GetFilterValue	P62	○	○
ArtCam_SetBrightness	P63	○	○
ArtCam_GetBrightness	P64	○	○
ArtCam_SetContrast	P63	○	○
ArtCam_GetContrast	P64	○	○
ArtCam_SetHue	P63	○	○
ArtCam_GetHue	P64	○	○
ArtCam_SetSaturation	P63	○	○
ArtCam_GetSaturation	P64	○	○
ArtCam_SetSharpness	P63	○	×
ArtCam_GetSharpness	P64	○	×
ArtCam_SetBayerGainRGB	P63	○	×
ArtCam_GetBayerGainRGB	P64	○	×
ArtCam_SetBayerGainRed	P63	○	×
ArtCam_GetBayerGainRed	P64	○	×
ArtCam_SetBayerGainGreen	P63	○	×
ArtCam_GetBayerGainGreen	P64	○	×
ArtCam_SetBayerGainBlue	P63	○	×
ArtCam_GetBayerGainBlue	P64	○	×
ArtCam_SetBayerGainAuto	P63	○	×
ArtCam_GetBayerGainAuto	P64	○	×
ArtCam_SetGamma	P63	○	×
ArtCam_GetGamma	P64	○	×
ArtCam_SetBayerMode	P63	○	×
ArtCam_GetBayerMode	P64	○	×
ArtCam_SetGlobalGain	P63	×	×
ArtCam_GetGlobalGain	P64	×	×
ArtCam_SetColorGainRed	P63	×	×
ArtCam_GetColorGainRed	P64	×	×
ArtCam_SetColorGainGreen1	P63	×	×
ArtCam_GetColorGainGreen1	P64	×	×
ArtCam_SetColorGainGreen2	P63	×	×
ArtCam_GetColorGainGreen2	P64	×	×
ArtCam_SetColorGainBlue	P63	×	×
ArtCam_GetColorGainBlue	P64	×	×
ArtCam_SetExposureTime	P63	×	×
ArtCam_GetExposureTime	P64	×	×

Function name

ArtCam_GetDllVersion

Outline

Obtain version of library

Models

USTC CNV

Language

C C++ VB C# Delphi

Return value

DWORD

Upper 16 bits DLL type

Lower 16 bits DLL version

Argument

Non

Explanation

Obtain version and type of DLL

Among 32 bits, DLL type is stored in upper 16 bits while DLL version is stored in lower 16 bits.

Before you use library, check that the versions of DLL installed and SDK are the same.

DLL types are as followings:

Codes	Device type
ARTCAM_CAMERATYPE_130	ARTCAM-130 / ARTCAM-48
ARTCAM_CAMERATYPE_130K	ARTCAM-130KP
ARTCAM_CAMERATYPE_USTC	ARTUST-0209C
ARTCAM_CAMERATYPE_CNV	ARTCNV
ARTCAM_CAMERATYPE_130MI	ARTCAM-130MI
ARTCAM_CAMERATYPE_OV200	ARTCAM-OV200
ARTCAM_CAMERATYPE_200MI	ARTCAM-200MI
ARTCAM_CAMERATYPE_300MI	ARTCAM-300MI
ARTCAM_CAMERATYPE_150P	ARTCAM-150P
ARTCAM_CAMERATYPE_320P	ARTCAM-320P
ARTCAM_CAMERATYPE_MV03	ARTCAM-MV03
ARTCAM_CAMERATYPE_200SH	ARTCAM-200SH
ARTCAM_CAMERATYPE_098	ARTCAM-098
ARTCAM_CAMERATYPE_036MI	ARTCAM-036MI
ARTCAM_CAMERATYPE_500P	ARTCAM-500P

Version can be obtained in 4 digits integer.

i.e. if version is 1.23, returned value is 1230.

Function name

ArtCam_GetLastError

Outline

Obtain error

Models

USTC CNV

Language

C C++ VB C# Delphi

Return value

LONG

Error code

Argument

HACAM	hACam	Handle for camera identification

Explanation

When an error occurs, call this function to obtain details of error

Error is stored in stack type of data configuration.
Errors can be called in sequential order

Function name

ArtCam_Initialize

Outline

Initialize library

Models

USTC CNV

Language

C C++ VB C# Delphi

Return value

HACAM

Success: Handle for camera identification

Failure: Null or 0

Argument

HACAM	hACam	Handle for camera identification
HWND	hWnd	Window handle for obtaining error code

Explanation

Initialize library.

Call this function first when you use this library

By setting window handle to **hWnd,** WM_ERROR is sent to window procedure when an error occurs.

Function name

ArtCam_Release

Outline

Release library

Models

USTC CNV

Language

C C++ VB C# Delphi

Return value

BOOL

Success: TRUE or 1

Failure: FALSE or 0

Argument

HACAM	hACam	Handle for camera identification

Explanation

Release all plugged cameras, and initialize all data within class.

Call this function when you end application or stop operation of cameras.

To display image again, call ArtCam_Initialize.

Function name

ArtCam_Preview

Outline

Display image

Models

USTC CNV

Language

C C++ VB C# Delphi

Return value

BOOL

Success: TRUE or 1

Failure: FALSE or 0

Argument

HACAMhACam	Handle for camera identification

Explanation

Image display is controlled by SDK.

Call ArtCam_Initialize before using this function.

When this function succeeds, create a sub-window within the window appointed by ArtCam_SetPreviewWindow. Image will be displayed in the sub-window.

If setting is not done by ArtCam_SetPreviewWindow, new window will be created, and image will be displayed.

Function name

ArtCam_Record

Outline

Record

Model

Non (only exists for the purpose of compatibility with other models)

Language

C C++ VB C# Delphi

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
LPCTSTR	lpAviName:	Name of file to be saved
UINT	RecTime:	Recording time (milli-second). Continuous recording at 0
BOOL	fShow:	Display or hide image

Explanation

When **RecTime** is appointed, recording will automatically end as time out. However, device will not be released, and therefore image will still be displayed.
If you like to execute some process at the end of recordings, you need to obtain timing using timer. Regarding **fShow**, hiding image will prevent loss of frames.

Remark: Currently there is no function that uses this DLL.

Function name

ArtCam_CallBackPreview

Outline

Obtain image data while display live video

Models

USTC CNV

Language

C C++ VB*1 C# Delphi

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam	Handle for camera identification
HWND	hWnd	Window handle for receiving message
LPBYTE	lpImage	Address of alignment for receiving image data
LONG	Size	Alignment length of **lpImage**
BOOL	TopDown	Determine whether image is up or down

Explanation

When **hWnd** is appointed to window handle, WM_GRAPHPAINT is sent to appointed window procedure.

When **lpImage** and **Size** are appointed, image is copied to the alignment, which was appointed at **lpImage** before WM_GRAPHPAINT.
Image will not be copied unless the size of alignment is equal to or larger than size of image.

Do not insert address of temporary alignment to **lpImage**.
If bitmap prepared is DDB (top-down), specify **Topdown** as True. If bitmap is DIB (bottom-up), specify **Topdown** as False.

Like ArtCam_Preview, this function also has automatic display. Procedure for auto-display is same as that of ArtCam_Preview.

*1: It is relatively difficult to obtain message with VB. There may be error due to processing speed of VB. Although the function itself can be used, real-time processing by WM_GRAPHPAINT should be avoided.
(With the current sample, that procedure is removed, and timing of display is controlled by timer)

Function name

ArtCam_SnapShot

Outline

Obtain a snapshot

Models

USTC CNV

Language

C C++ VB C# Delphi

Version

1230 or later

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
LPBYTE	lpImage	Address of alignment for receiving image data
LONG	Size	Alignment length of **lpImage**
BOOL	TopDown	Determination of ups and down of image

Explanation

Obtain image of camera.
When function succeeds, obtained data is stored in **lpImage.**
Image will not be obtained unless the size of alignment is equal to or larger than size of image.
If bitmap prepared is DDB (top-down), specify **Topdown** as True. If bitmap is DIB (bottom-up), specify **Topdown** as False.

While ArtCam_GetImage captures a frame in preview mode, **ArtCam_SnapShot** captures a frame in non-preview mode.

This function will fail if preview is displayed with other functions such as ArtCam_Preview

Function name
ArtCam_Capture

Outline
Initialize camera for continuous snapshot

Models
USTC CNV

Language
C C++ VB C# Delphi

Version
1250 or later

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Return value		
HACAM	hACam	Handle for camera identification

Explanation

Initialize camera to use ArtCam_SnapShot continuously.

Normally when ArtCam_SnapShot is used, procedure proceeds as following:
Initialize – Obtain – Release

However, if you initialize beforehand with this function, the process of "Initialize" and "Release" will be ignored when ArtCam_SnapShot is called. Hence the image can be obtained with high-speed.
To stop ArtCam_SnapShot and release camera, call ArtCam_Close.

The main flow is as following:

Initialize
ArtCam_Capture

Can be used unlimitedly
ArtCam_SnapShot

Release
ArtCam_Close

Function name

ArtCam_Trigger

Outline

Obtain camera image in external trigger mode

Models

Non (only exists for the purpose of compatibility with other models)

Language

C C++ VB C# Delphi

Version

1260 or later

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam	Handle for camera identification
HWND	hWnd	Window handle for receiving message
LPBYTE	lpImage	Address of alignment for receiving image data
LONG	Size	Alignment length of **lpImage**
BOOL	TopDown	Determine whether image is up or down

Explanation

Procedure of this function is similar to that of ArtCam_CallBackPreview. Timing of capturing depends on camera's closck speed with ArtCam_CallBackPreview. With this function, capturing is processed when triggered with external trigger.

When you initialize with this function, updates and obtaining message of image is sent only after the trigger is sent to camera.

Message name

WM_GRAPHPAINT

Outline

Receive data alignment of image

Models

USTC CNV

Language

C C++ VB C# Delphi

Argument

WPARAM	wParam	LPGP_INFO
LPARAM	lParam	NULL

Explnation

LPGP_INFO lpGPIF = (LPGP_INFO)wParam
Pointer to the structure that stores image data

This message is sent to the callback procedure of the window when Window Handle is set to hWnd at ArtCam_CallBackPreview and ArtCam_Trigger.

This message is sent when image is updated.

To obtain image data, assign pointer and array length of alignment to IpImage and Size of ArtCam_CallBackPreview. Then image data is stored in appointed alignment when this message is sent.

When wParam is NULL, WM_GRAPHPAINT becomes error.
wParam and lParam will mean WM_ERROR.

WM_GRAPHPAINT is defined as 0x8002

Message name

WM_ERROR

Outline

Receive error

Models

USTC CNV

Language

C C++ VB C# Delphi

Argument

WPARAM	wParam	0
LPARAM	lParam	Error code

Explanation

When Window Handle is appointed at ArtCam_Initialize, error code is sent to Window Procedure in case error occurs within SDK.

WM_ERROR is defined as 0x8003.

Error codes are as followings:

ARTCAMSDK_NOERROR	Normal
ARTCAMSDK_NOT_INITIALIZE	Not initialised
ARTCAMSDK_DISABLEDDEVICE	Accessed denied by disabled device
ARTCAMSDK_CREATETHREAD	Failure of creating thread of image capturing
ARTCAMSDK_CREATEWINDOW	Failure of creating window
ARTCAMSDK_OUTOFMEMORY	Not enough memory for image transfer Or failure to secure memory
ARTCAMSDK_CAMERASET	Error of camera settings
ARTCAMSDK_CAPTURE	Failure of capturing
ARTCAMSDK_PARAM	Wrong argument
ARTCAMSDK_DIRECTSHOW	Failure of Directshow initialization
ARTCAMSDK_UNSUPPORTED	Function not supported
ARTCAMSDK_UNKNOWN	Unknow error
ARTCAMSDK_CAPTURELOST	Device lost

Function name

ArtCam_Close

Outline

Release device

Models

USTC CNV

Language

C C++ VB C# Delphi

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam	Handle for camera identification

Explanation

Stop preview screen, and release deivce.

Use this function to release device when you obtain images with the following function.

ArtCam_Preview
ArtCam_Record
ArtCam_CallBackPreview
ArtCam_Capture
ArtCam_Trigger

Functio name

ArtCam_StartPreview

Outline

Display preview of image

Models

USTC CNV

Language

C C++ VB C# Delphi

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam	Handle for camera identification

Explanation

Start preview of camera image

This function is used internally for ArtCam_Preview, ArtCam_Record & ArtCam_CallBackPreview.

This function is only used to regenerate image, in which preview is stop, by calling ArtCam_StopPreview.

Function name

ArtCam_StopPreview

Outline

Stop preview of image

Models

USTC CNV

Language

C C++ VB C# Delphi

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam	Handle for camera identification

Explanation

This function stops preview of image.
This function does not release device. Only use this function when you need to stop preview temporarily.

To display preview again, use ArtCam_StartPreview.

This function is only available when preview is displayed with ArtCam_Preview and ArtCam_CallBackPreview.

Function name

ArtCam_SaveImage

Outline

Save image

Models

USTC CNV

Language

C C++ VB C# Delphi

Version

1260 or later

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam	Handle for camera identification
LPCTSTR	lpSaveName	File name
LONG	FileType	Type of file

Explnation

Save camera image in computer files

Image to be saved is the last image obtained by image-capturing functions such as ArtCam_Preview, ArtCam_CallBackPreview, ArtCam_SnapShot & ArtCam_Trigger

Please not that depending on system environment, speed clock of camera and file types, saved image may deteriorate while real-time image is obtained with ArtCam_Preview and ArtCam_CallBackPreview.

When this happens, stopping image update temporarily by ArtCam_StopPreview may prevent image deterioration.

This function is used to save live image obtained by camera.
To save images that are processed by application, save the images at application.

File type can be selected from BMP, binary (RAW), JPEG (high-quality, standard & low-quality), PNG and TIFF.

You cannot save 16 bits image in JPEG
When you save image in JPEG, it is saved as gray scale of 8 bits bit-depth.

BMP and RAW can be saved in 16 bits. However, pallet info is not saved in file. Therefore image may not be display correctly for softwares that do not have special reading routine.

To save images in 16 bits, use of PNG and TIFF are recommended. With these file formats, we recommend you to read the images in Artray's Viewer Software or Adobe Photoshop6.

Please note that not every image-processing application is compatible with 16 bits image.

Regarding files to be saved with this function, we only support on reading procedure on BMP and RAW.

We will not provide suppont on reading procedures of other file formats and saving procedure.

Function name

ArtCam_GetImage

Outline

Obtain image

Models

USTC CNV

Language

C C++ VB C# Delphi

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
LPBYTE	lpImage:	Address of alignment which receives data of image
LONG	Size	Alignment length of **lpImage**
BOOL	TopDown	Determination of ups and down of image

Explanation

Obtain image of camera.
When function succeeds, previously obtained data is stored in **lpImage.**
Image will not be obtained unless the size of alignment is equal to or larger than size of image.
If bitmap prepared is DDB (top-down), specify **Topdown** as True. If bitmap is DIB (bottom-up), specify **Topdown** as False.

This function is used to obtain image asynchronously while ArtCam_Preview or ArtCam_CallBackPreview is used.
If you only need to obtain 1 frame, use ArtCam_SnapShot.
This function assumes that the PC with low specs is used, or language, which has slow processing speed, is used.
To create with C & C++, receive message of image updates by WM_GRAPHPAINT

Function name

ArtCam_SetCameraDlg

Outline

Display dialog of camera settings

Models

USTC CNV

Language

C C++ VB C# Delphi

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
HWND	hWnd	Parent window for displaying dialog

Explanation

This function displays a dialog box that allows you to alter settings such as size of image and frame rate.
Dialog box displayed varies with the device plugged.
When you call this function while preview is displayed, preview will temporarily stop. Preview will be displayed again once dialog box is closed.

Fucntion name

ArtCam_SetImageDlg

Outline

Display dialog of filter settings

Models

USTC CNV

Language

C C++ VB C# Delphi

Return value

BOOL

Success: TRUE or 1

Failure: FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
HWND	hWnd:	Parent window for displaying dialog

Explanation

This function displays a dialog box that allows you to alter settings such as brightness, contrast and white balance.

Dialog box displayed varies with the device plugged.

Function name

ArtCam_SetAnalogDlg

Outline

Display dialog of port/camera settings

Models

Non (only exists for the purpose of compatibility with other models)

Language

C C++ VB C# Delphi

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
HWND	hWnd:	Parent window for displaying dialog

Explanation

This function displays a dialog box that allows you to alter settings such as analog port and internal camera device.
Dialog box displayed varies with the device plugged.

Function name

ArtCam_SetPreviewWindow

Outline

Set preview window

Models

USTC CNV

Language

C C++ VB C# Delphi

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam	Handle for camera identification
HWND	hWnd	Appoint handle of window to be displayed
LONG	Left	Appoint upper-left X-coordinate of rectangle
LONG	Top	Appoint upper-left Y-coordinate of rectangle
LONG	Right	Appoint lower-right X-coordinate of rectangle
LONG	Bottom	Appoint lower-right Y-coordinate of rectangle

Explanation

When Window handle is appointed to hWnd, create slave window in the window and display in the slave window.

When **NULL** is appointed to **hWnd**, create new window.

Function name
ArtCam_SetCaptureWindow

Outline
Appoint image size and frame rate

Models
USTC

Language
C C++ VB C# Delphi

Return value
BOOL Success: TRUE or 1 Failure: FALSE or 0

Argument		
HACAM	hACam:	Handle for camera identification
LONG	Width:	Appoint width of image in the unit of pixel
LONG	Height:	Appoint height of image in the unit of pixel
LONG	Frame	Appoint frame rate

Explanation

---ArtCamSdk.dll---

For Frame, appoint frame number calculated by FPS (frame rate per second) × 10.

i.e. if FPS is 30, it will be 300.

---Other case---

Frame will be ignored.

Based on Width and Height as operative resolution, most appropriate value among registered will be set.

Please use ArtCam_SetCaptureWindowEx.

Function name

ArtCam_SetCaptureWindowEx

Outline

Appoint size of image

Models

USTC

Language

C C++ VB C# Delphi

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
LONG	Htotal:	Appoint total width of camera in the unit of pixel
LONG	Hstart:	Appoint starting point of width
LONG	Heffective:	Appoint operative width of camera
LONG	Vtotal:	Appoint total height of camera in the unit of pixel
LONG	Vstart:	Appoint starting point of height
LONG	Veffective:	Appoint operative height of camera

Explanation

--- ArtCamSdk.dll---

Please use ArtCam_SetCaptureWindow.

---Other case---

Appoint size of camera

Function name

ArtCam_GetCaptureWindowEx

Outline

Obtain size of image

Models

USTC

Language

C C++ VB C# Delphi

Return value

BOOL

Success: TRUE or 1

Failure: FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
LONG	*Htotal:	Returns total width of camera in unit of pixel
LONG	*Hstart:	Returns starting point of width
LONG	*Heffective:	Returns operative width of camera
LONG	*Vtotal:	Returns total height of camera in unit of pixel
LONG	*Vstart:	Returns starting point of height
LONG	*Veffective:	Returns operative height of camera

Explanation

--- ArtCamSdk.dll---

Use ArtCam_Width ArtCam_Height ArtCam_Fps

---Other case---

Obtain each parameter of camera

Function name

ArtCam_SetColorMode

Outline

Set color mode of capturing

Model

USTC CNV

Language

C C++ VB C# Delphi

Return value

BOOL

Success: TRUE or 1

Failure: FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
LONG	ColorMode:	Number of data bits

Explanation

--- ArtCamSdk.dll---

Do not use. Image is fixed at 24 bits color.

---Other case---

Appoint number of bits.

8: 8 bits monochrome image

16 16 bits monochrome image (10 bits for cameras & 16 bits for CNV converters)

24: 24 bits color image (BGR, 8 bits each)

32: 32 bits color image (BGRA, 8 bits, A=invalid)

48: 48 bits color image (BGR, 16 bits each)

64: 64 bits color image (BGRA, 16 bits each, A=invalid)

With 16 (10) bits, numerical values vary slightly depending on the environment.

When you create an application, make sure that the application is compatible with 10, 12, 14, & 16.

Function name

ArtCam_GetColorMode

Outline

Obtain current color mode

Model

USTC CNV

Language

C C++ VB C# Delphi

Return value

LONG
Success: Number of bits for image
Failure: -1

Argument

HACAM	hACam	Handle for camera identification

詳細説明

--- ArtCamSdk.dll---

Do not use. Image is fixed at 24 bits color.

---Other case---

Appoint number of bits.
8: 8 bits monochrome image
16 16 bits monochrome image (10 bits for cameras & 16 bits for CNV converters)
24: 24 bits color image (BGR, 8 bits each)
32: 32 bits color image (BGRA, 8 bits, A=invalid)
48: 48 bits color image (BGR, 16 bits each)
64: 64 bits color image (BGRA, 16 bits each, A=invalid)

With 16 (10) bits, numerical values vary slightly depending on the environment.
When you create an application, make sure that the application is compatible with 10, 12, 14, & 16.

Function name

ArtCam_SetCrossbar

Outline

Appoint analog port to be plugged

Modle

Non (only exists for the purpose of compatibility with other models)

Language

C C++ VB C# Delphi

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
LONG	Output:	Number of output port
LONG	Input:	Number of input port

Explanation

--- ArtCamSdk.dll---

Plugging analog port can be altered without calling ArtCam_SetAnalogDlg.
Appoint number of integer from 0.

---Other case---

Do not use this function

Function name

ArtCam_SetDeviceNumber

Outline

Appoint number of device to be plugged

Models

USTC CNV

Language

C C++ VB C# Delphi

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
LONG	Number:	Appoint device number from 0 to9.

Explanation

After you call this function and initialize with functions such as **ArtCam_ Preview, ArtCam_ Record & ArtCam_CallBackPreview,** image of appointed device will be displayed. To confirm device number, use **ArtCam_EnumDevice & ArtCam_GetDeviceName.**

File name

ArtCam_EnumDevice

Outline

Recount names of operative device

Models

USTC CNV

Language

C C++ Delphi

Return value

LONG

Number of operative devices

Argument

HACAM	hACam:	Handle for camera identification
TCHAR	szDeviceName:	Names of operative devices are copied

Explanation

Number appointed by ArtCam_SetDeviceNumber is same as alignment number stored in **szDeviceName.**

To use device stored in **szDeviceName[1],** appoint **ArtCam_SetDeviceNumber (1).**

To obtain device name with other language, please use ArtCam_GetDeviceName.

Function name

ArtCam_GetDeviceName

Outline

Obtain name of appointed device

Models

USTC CNV

Language

C C++ VB C# Delphi

Return value

BOOL
Operative: TRUE or 1
Inoperative: FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
LONG	index:	Appoint device number from 0 to9
LPSTR	szDeviceName:	Names of operative devices are copied
LONG	nSize:	Size of **szDeviceName**

Explanation

Confirm if device appointed by **index** is operative. If it's operative, store the name of device to **szDeviceName.**

Function name

ArtCam_Width

Outline

Obtain width of image

Model

USTC CNV

Language

C C++ VB C# Delphi

Return value

LONG

Obtain width of camera

Argument

HACAM	hACam	Handle for camera identification

Explanation

----ArtCamSdk.dll----

Assigned Width value is returned at ArtCam_SetCaptureWindow

----ArtCnvSdk.dll , ArtCamSdk_320P.dll & ArtCamSdk_500P.dll----

Standard size set within SDK is returned.

----Others----

Assigned Heffective value at ArtCam_SetCaptureWindowEx is returned.

Function name

ArtCam_Height

Outline

Obtain height of image

Models

USTC CNV

Language

C C++ VB C# Delphi

Return value

LONG

Obtain height of camera.

Argument

HACAM	hACam	Handle for camera identification

Explanation

----ArtCamSdk.dll----

Assigned Height value is returned at ArtCam_SetCaptureWindow

----ArtCnvSdk.dll & ArtCamSdk_320P.dll----

Standard size set within SDK is returned.

----Others----

Assigned Veffective value at ArtCam_SetCaptureWindowEx is returned.

Function name

ArtCam_Fps

Outline

Obtain frame rate

Models

Non (only exists for the purpose of compatibility with other models)

Language

C C++ VB C# Delphi

Return value

LONG

Obtain assigned frame rate

Argument

HACAM	hACam	Handle for camera identification

Explanation

----ArtCamSdk.dll----

Frame rate is obtained by following: FPS × 10

i.e. if FPS is 30, it will be 300.

----Other----

Do not use this function

Function name

ArtCam_SetIOPort

Outline

Write data in IO

Models

USTC

Language

C C++ VB C# Delphi

Version

1230 or later

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
BYTE	byteData:	Write data in IO（Byte data）
LONG	longData:	Not in use. Appoint 0.
DWORD	Reserve:	Not in use. Appoint 0.

Explanation

Write data (8 bits) in IO port
Among 8 bits, actual bits to be written are as following

b7	b6	b5	b4	b3	b2	B1	b0
×	×	×	×	○	○	○	○

This function is only used in **ArtCamSdk_USTC** of ARTUST.

Function name

ArtCam_GetIOPort

Outline

Read data from IO

Model

USTC CNV

Language

C C++ VB C# Delphi

Version

1230 or later

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam:	Handle of camera identification
LPBYTE	byteData:	Not in use. Appoint NULL.
LPLONG	longData:	Read data from IO (4Byte data)
DWORD	Reserve:	Not in use. Appoint 0.

Explanation

----ArtCamSdk_USTC.dll----
Read data (8 bits) from IO port.

Among 8 bits, actual bits to be read are as following
Data of following 3 bits are read.

b7	b6	b5	b4	b3	b2	B1	b0
×	○	○	○	×	×	×	×

----ArtCnvSdk.dll----
Read data (4 bits) from IO port.

Function name

ArtCam_SetSubSample

Outline

Set pixel skipping transfer mode

Models

Non (only exists for the purpose of compatibility with other models)

Language

C C++ VB C# Delphi

Version

1230 or later

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
LONG	SubSampleMode:	Sub-Sample mode

Explanation

This function sets pixel skipping transfer mode.
Thinning out image is transferred. Image is thinned out by value set in **SubSampleMode.**
When ArtCam_CallBackPreview is used in this function, data less than assigned image size is transferred.

SUBSAMPLE_1	All data
SUBSAMPLE_2	Data equals to half of matrix
SUBSAMPLE_4	Data equals to quarter of matrix
SUBSAMPLE_8	Data equals to eighth of matrix

Function name

ArtCam_GetSubSample

Outline

Obtain current pixel skipping transfer mode

Models

Non (only exists for the purpose of compatibility with other models)

Language

C C++ VB C# Delphi

Version

1230 or later

Return value

LONG
Success: Current mode
Failure: -1

Argument

HACAM	hACam	Handle for camera identification

Explanation

Obtain current pixel skipping transfer mode.

SUBSAMPLE_1	All data
SUBSAMPLE_2	Data equals to half of matrix
SUBSAMPLE_4	Data equals to quarter of matrix
SUBSAMPLE_8	Data equals to eighth of matrix

Function name
ArtCam_SetWaitTime

Outline
Assign Wait Time

Models
USTC CNV

Language
C C++ VB C# Delphi

Version
1230 or later

Return value
BOOL Success: TRUE or 1 Failure: FALSE or 0

Argument		
HACAM	hACam:	Handle for camera identification
LONG	WaitTime:	Wait time

Explanation
This function assigns waiting time for obtaining video from ArtCam_Preview & ArtCam_CallBackPreview Frame rate will decrease when you assign a large value for Wait Time.

Function name
ArtCam_GetWaitTime

Outline
Obtain WaitTime

Models
USTC CNV

Language
C C++ VB C# Delphi

Version
1230 or later

Return value
LONG Success: Wait Time Failure: -1

Argument		
HACAM	hACam	Handle for camera identification

Explanation
Obtain current Wait Time for capturing video by ArtCam_Preview & ArtCam_CallBackPreview.

Function name

ArtCam_SetMirrorV

Outline

Set flip vertical mirroring function

Models

Non (only exists for the purpose of compatibility with other models)

Language

C C++ VB C# Delphi

Version

1240 or later

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam	Handle for camera identification
BOOL	Flg	Reverse flag

Explanation

With camera's hardware function, you can transfer data in flip vertical. Setting Flg to True will enable mirroring function, while false will disable the function.

Function name

ArtCam_GetMirrorV

Outline

Obtain conditions of flip vertical mirroring function

Models

Non (only exists for the purpose of compatibility with other models)

Language

C C++ VB C# Delphi

Version

1240 or later

Return value

BOOL
Mirroring function enabled: True or 1
Mirroring function disabled: False or 0

Argument

HACAM	hACam	Handle for camera identification

Explanation

Confirm if flip vertical mirroring function is enabled or not.

Function name

ArtCam_SetMirrorH

Outline

Set flip horizontal mirroring function

Model

Non (only exists for the purpose of compatibility with other models)

Vertical

C C++ VB C# Delphi

Version

1240 or later

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam	Handle for camera identification
BOOL	Flg	Reverse flag

Explanation

With camera's hardware function, you can transfer data in flip horizontal. Setting Flg to True will enable mirroring function, while false will disable the function.

Function name

ArtCam_GetMirrorH

Outline

Obtain conditions of flip horizontal mirroring function

Models

Non (only exists for the purpose of compatibility with other models)

Language

C C++ VB C# Delphi

Version

1240 or later

Return value

BOOL
Mirroring function enabled: True or 1
Mirroring function disabled: False or 0

Argument

HACAM	hACam	Handle for camera identification

Explanation

Confirm if mirroring flip horizontal function is enabled or not.

Function name

ArtCam_SetHalfClock

Outline

Halve clock speed of camera

Models

Non (only exists for the purpose of compatibility with other models)

Language

C C++ VB C# Delphi

Version

1260 or later

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam	Handle for camera identification
LONG	Value	Flag for half clock

Explanation

Clock speed of camera can be halved. Halving clock speed will halve frame rate.

Use this function when you connect several cameras with low spec. PC.

This function does not allow direct switching.
Having set this function in advance, clock switching will be reflected when you initialize using image capturing functions.
Depending on models, clock switching may take up to several seconds.

Function name

ArtCam_GetHalfClock

Outline

Obtain condition of camera clock speed

Models

Non (only exists for the purpose of compatibility with other models)

Language

C C++ VB C# Delphi

Version

1260 or later

Return value

BOOL

Success: Half clock=TRUE, Normal clock=FALSE
Error=TRUE or 1

Failure: Unknown
Error=FALSE or 0

Argument

HACAM	hACam	Handle for camera identification
LPBOOL	Error	Error information

Explanation

Obtain condition of camera clock speed.

Function name

ArtCam_SetAutoIris

Outline

Set Auto-iris

Model

Non (only exists for the purpose of compatibility with other models)

Language

C C++ VB C# Delphi

Version

1260 or later

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam	Handle for camera identification
LONG	Value	Flag for auto-iris

Explanation

Set auto-iris.

0=disabled
1=Adjust exposure time and set auto-iris
2=Adjust global gain and set auto-iris

Work environment may vary depending on models.

Function name

ArtCam_GetAutoIris

Outline

Obtain condition of auto-iris

Models

Non (only exists for the purpose of compatibility with other models)

Language

C C++ VB C# Delphi

Version

1260 or later

Return value

BOOL

Success: Disable=0, Exposure time settings=1 & Gain settings=2

Error =TRUE or 1

Failure: Unknown

Error=FALSE or 0

Argument

HACAM	hACam	Handle for camera identification
LPBOOL	Error	Error info

Explanation

Obtain condition of auto-iris.

Function name

ArtCam_ SetSamplingRate

Outline

Set frame rate and capturing size

Model

CNV

Language

C C++ VB C# Delphi

Version

1275 or later

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam	Handle for camera identification
LONG	Value	Capturing mode

Explanation

Set frame rate and capturing size

Below are the modes available (NTSC)

0 720×470 30 frame
1 720×480 15 frame
2 640×470 30 frame
3 640×480 15 frame

Function name

ArtCam_ GetSamplingRate

Outline

Obtain frame rate and capturing size

Model

CNV

Language

C C++ VB C# Delphi

Version

1275 or later

Return value

LONG

Success: Capturing mode

Error: TRUE or 1

Failure: Indeterminate

Error: False or 0

Argument

HACAM	hACam	Handle for camera identification
LPBOOL	Error	Error Info

詳細説明

Obtain frame rate and capturing size

Below are the modes available (NTSC)

0 720×470 30 frame

1 720×480 15 frame

2 640×470 30 frame

3 640×480 15 frame

Function name

ArtCam_ GetVideoFormat

Outline

Obtain type of image signal of camera

Model

CNV

Language

C C++ VB C# Delphi

Version

1275 or later

Return value

LONG

Success: Video format

Error: TRUE or 1

Failure: Indeterminate

Error: FALSE or 0

Argument

HACAM	hACam	Handle for camera identification
LPBOOL	Error	Error info

Explanation

Obtain type of image signal of camera

Below are the details of video format

0 NTSC

1 PAL

2 PALM

3 SECAM

Function name

ArtCam_WriteSromID

Outline

Register subcode

Models

Non (only exists for the purpose of compatibility with other models)

Language

C C++ VB C# Delphi

Version

1276 or later

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
LONG	Address:	Write address
LONG	Value:	Write date

Explanation

Write data for identification in camera.

For Value, the number between 0 to 255 can be calculated.
Remark: the number more than 255 will be rounded down.

Function name

ArtCam_ReadSromID

Outline

Read subcode

Models

Non (only exists for the purpose of compatibility with other models)

Language

C C++ VB C# Delphi

Version

1276 or later

Return value

LONG
Success: Take in mode
Error = TRUE or 1
Failure: Unknown
Error = FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
LONG	FilterType:	Type of filter
LONG	Error:	Error Info

Explanation

Read data for identification from camera.

After register proper ID in camera with ArtCam_WriteSromID,
When you use more than one camera,
You can control them separately.

Function name

ArtCam_SetFilterValue

Outline

Set filter value of image

Models

USTC CNV

Language

C C++ VB C# Delphi

Version

1230 or later

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam:	Handle for camera identification
LONG	FilterType:	Type of filter
LONG	Value:	Value to be set

Explanation

This function allows you to directly set values, which can be set with ArtCam_SetImageDlg.

Regarding **FilterType**, please refer to defined file of each language.

Function name

ArtCam_GetFilterValue

Outline

Obtain filter value of image

Models

USTC CNV

Language

C C++ VB C# Delphi

Version

1230 or later

Return value

BOOL
Success: Assigned value, TRUE or 1 for Error
Failure: Indefinite, FALSE or 0 for Error

Argument

HACAM	hACam:	Handle for camera identification
LONG	FilterType:	Type of filter
LPBOOL	Error:	Error info

Explanation

This function allows you to obtain value of parameter that can be set by ArtCam_SetImageDlg.
When you set NULL for Error, error info will not be obtained.

Regarding **FilterType**, please refer to defined file of each language.

Function

ArtCam_Set***

Outline

Set image filter data

Models

USTC CNV

Language

C C++ VB C# Delphi

Version

1240 or later

Return value

BOOL
Success: TRUE or 1
Failure: FALSE or 0

Argument

HACAM	hACam	Handle for camera identification
LONG	Value	Value to be set

Explanation

Wrapper function of ArtCam_SetFilterValue
This function will be called when second argument of ArtCam_SetFilterValue is set

Please refer to P.65 for features of each function.

Function name

ArtCam_Get***

Outline

Obtain image filter data

Models

USTC　CNV

Language

C　C++　VB　C#　Delphi

Version

1230 or later

Return value

BOOL

Success: Value already set	Error=TRUE or 1
Failure: Unknown	Error=False or 0

Argument

HACAM	hACam	Handle for camera identification
LPBOOL	Error	Error detail

Explanation

Wrapper function of ArtCam_GetFilterValue

This function will be called when second argument of ArtCam_GetFilterValue is set

Please refer to P.65 for features of each function.

Features of each function can be listed as below:

Function name	Filter type
ArtCam_SetBrightness ArtCam_GetBrightness	ARTCAM_FILTERTYPE_BRIGHTNESS
ArtCam_SetContrast ArtCam_SetContrast	ARTCAM_FILTERTYPE_CONTRAST
ArtCam_SetHue ArtCam_GetHue	ARTCAM_FILTERTYPE_HUE
ArtCam_SetSaturation ArtCam_GetSaturation	ARTCAM_FILTERTYPE_SATURATION
ArtCam_SetSharpness ArtCam_GetSharpness	ARTCAM_FILTERTYPE_SHARPNESS
ArtCam_SetBayerGainRGB ArtCam_GetBayerGainRGB	ARTCAM_FILTERTYPE_BAYER_GAIN_RGB
ArtCam_SetBayerGainRed ArtCam_GetBayerGainRed	ARTCAM_FILTERTYPE_BAYER_GAIN_R
ArtCam_SetBayerGainGreen ArtCam_GetBayerGainGreen	ARTCAM_FILTERTYPE_BAYER_GAIN_G
ArtCam_SetBayerGainBlue ArtCam_GetBayerGainBlue	ARTCAM_FILTERTYPE_BAYER_GAIN_B
ArtCam_SetBayerGainAuto ArtCam_GetBayerGainAuto	ARTCAM_FILTERTYPE_BAYER_GAIN_AUTO
ArtCam_SetGamma ArtCam_GetGamma	ARTCAM_FILTERTYPE_GAMMA
ArtCam_SetBayerMode ArtCam_GetBayerMode	ARTCAM_FILTERTYPE_BAYERMODE
ArtCam_SetGlobalGain ArtCam_GetGlobalGain	ARTCAM_FILTERTYPE_GLOBAL_GAIN
ArtCam_SetColorGainRed ArtCam_GetColorGainRed	ARTCAM_FILTERTYPE_COLOR_GAIN_R
ArtCam_SetColorGainGreen1 ArtCam_GetColorGainGreen1	ARTCAM_FILTERTYPE_COLOR_GAIN_G1
ArtCam_SetColorGainGreen2 ArtCam_GetColorGainGreen2	ARTCAM_FILTERTYPE_COLOR_GAIN_G2
ArtCam_SetColorGainBlue ArtCam_GetColorGainBlue	ARTCAM_FILTERTYPE_COLOR_GAIN_B
ArtCam_SetExposureTime ArtCam_GetExposureTime	ARTCAM_FILTERTYPE_EXPOSURETIME

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ARTRAY Camera / Capture Module Software Developer Kit

ArtCamSdk_USTCdll Ver1.276

ArtCnvSdk.dll Ver1.276

Dynamic Link Library for Windows,2000,XP

ARTRAY CO. LTD.

Ueno bldg, 1-39-8 Nogata Nakano-ku, Tokyo Japan 165-0027

Tel.: (81)3-3389-5488 Fax: (81)3-3389-5486

Email: artray@artray.co.jp

URL: http://www.artray.co.jp